



Riparian Forest Buffer

Wildlife Job Sheet Insert

391W

Natural Resources Conservation Service (NRCS)—Illinois

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Riparian forest buffer
Photo courtesy of L. Betts

Part I. Planning and Design Considerations

Applicability of Practice

All waterways from small creeks to major rivers have a riparian zone or floodplain. These areas are periodically flooded and represent a transition zone between upland and aquatic habitats. Riparian forest buffers established next to streams, lakes, ponds, seeps, or wetlands potentially provide many benefits to immediate and downstream aquatic habitats. These improvements to aquatic habitats may include improved water quality, cooler water temperatures, reduced soil erosion, stabilized stream banks, improved floodplain function, and recharge of groundwater aquifers. Properly functioning riparian areas are highly productive systems. Productivity of these areas is sustained by high inputs of leaf litter and periodic flooding which facilitates the rapid breakdown of litter and recycling of nutrients. Juxtaposition of riparian areas between upland and aquatic habitats and structural diversity of vegetation caused by frequent disturbances further contribute to the high use of riparian habitats by both resident and nonresident wildlife and aquatic species. Properly designed and maintained riparian forest buffers may

serve as breeding habitat, important travel or migration corridors for wildlife, shelter in winter, and critical resting and refueling stops for migratory songbirds during spring and fall.

Site Considerations

- Landowner objectives (types of wildlife use and agricultural use of the riparian area)
- Watershed objectives
- Adjacent waterbody use (e.g., recreation) and fish habitat condition
- Upland conditions and practices affecting riparian functions
- Soil qualities (texture, depth, moisture content)
- Stream channel type (constrained or unconstrained) and relationship to floodplain
- Connection to upstream and downstream habitat or to other nearby wildlife cover
- Width of area and ability to accommodate desired wildlife species
- Special wildlife needs (e.g., threatened or endangered species)



Northern bobwhite
Photo courtesy of J. M. Huspeth

Design Considerations

Fish and wildlife design considerations in Midwestern agricultural landscapes include (1) appropriateness of woody versus grass vegetation; (2) buffer width; (3) food value of plants; (4) plant selection to create non-uniform vegetative structure; (5) placement of plants within buffer; (6) adjacent land uses; and (7) opportunities to link the riparian area with other wildlife habitats. Soil survey and historical records should be referenced to decide whether to plant grass



Red-eared turtles
Photo courtesy of USDA NRCS

or woody plants in project area. As is true for all linear or strip habitats (e.g., fencerows, roadsides, or other buffer practices), wider buffers with non-uniform vegetative structure and irregularly clustered vegetative plantings will accommodate more species of wildlife than narrow, single species stands planted in rows. Where wildlife is the primary design consideration, the design should seek to increase width and structural diversity of plantings. Wildlife responses to width of riparian forest buffers are not well understood; consequently, recommended buffer widths vary widely among species. In the absence of better information, it is recommended that the width of riparian forest buffers extend to boundary of 100-year floodplain. Minimum width is that

needed to protect adjacent aquatic habitat. In the Midwest, buffer strips should be a minimum of 50 ft wide for first and second order streams and 100 ft wide for larger streams. Where woody plants are appropriate, buffers should be designed with herbaceous, shrub, and tree zones. Tall trees with spreading canopies should be planted streamside to a width of 25 ft (four or five plants) to provide shade, leaf litter, and large woody debris to the stream. Outside (upslope) edge of tree zone should be planted with two or more rows of shrubs and 20–24 ft of native grasses and forbs. Refer to the table in Part II to determine plant species most suitable to meet the fish and wildlife objectives. Selection of multiple native woody species and irregular placement of plants within zones is preferable to planting single species in rows.

Maintenance Considerations

The amount of maintenance required and the method used to maintain the vegetation of the riparian forest buffers depends on the fish, wildlife, and habitat goals; tree insect and disease issues; and weather. Riparian forest buffers are vulnerable to adverse impacts caused by upland management practices. The best place to address these impacts is in the uplands at the point of origin, rather than at the edge of the buffer. Because of its importance for filtering surface run-off, maintenance of the herbaceous zone must be done carefully. Timing of maintenance of shrub and tree zones is critical if nesting or migratory birds use the buffer. To minimize disturbance to nesting forest birds and avoid tree insect and disease problems, prune and thin from October through April. To encourage use by cavity nesters, allow dead and dying trees to remain. If removal is necessary, then do so selectively retaining a minimum of one snag/200 ft. Additionally, nest boxes that are properly sized for desired species may be erected.

Part II. List of Trees and Shrubs with Medium to High Value for Wildlife

Common Name	Scientific Name	pH Range ¹	Flooding Tolerance ²	Wildlife Merit ³	Height (feet) ⁴	IL Plant Suitability Zone ⁵
Arrowwood, southern	<i>Viburnum dentatum</i>	5.1–6.5	H	H	8	All
Ash, green	<i>Fraxinus pennsylvanica</i>	6.1–7.5	M	M	60	All
Ash, white	<i>Fraxinus americana</i>	6.1–7.5	L	M	70	All
Baldcypress	<i>Taxodium distichum</i>	6.1–6.5	VH	M	80	II, III
Birch, river	<i>Betula nigra</i>	4.0–6.5	M	M	50	All

—Continued

Part II. List of Trees and Shrubs with Medium to High Value for Wildlife (continued)

Common Name	Scientific Name	pH Range ¹	Flooding Tolerance ²	Wildlife Merit ³	Height (feet) ⁴	IL Plant Suitability Zone ⁵
Arrowwood, southern	<i>Viburnum dentatum</i>	5.1–6.5	H	H	8	All
Cottonwood, eastern	<i>Populus deltoides</i>	6.6–7.5	H	H	90	All
Dogwood, gray	<i>Cornus racemosa</i>	6.1–8.5	H	H	8	All
Dogwood, red-osier	<i>Cornus stolonifera</i>	6.1–8.5	H	H	12	All
Hackberry	<i>Celtis occidentalis</i>	6.6–8.5	M–L	M	60	All
Hickory*, shellbark	<i>Carya laciniosa</i>		M	H	70	All
Hickory, water	<i>Carya aquatica</i>		VH	H	70	III
Holly, swamp	<i>Ilex decidua</i>	4.0–8.5	VH	M	16	All
Maple, boxelder	<i>Acer nagundo</i>	5.1–7.5	M	M	40	All
Maple, red	<i>Acer rubrum</i>	4.5–6.5	M	M	70	All
Maple, silver	<i>Acer saccharinum</i>	5.5–7.5	M	M	80	All
Oak*, bur	<i>Quercus macrocarpa</i>	4.0–8.5	H	H	80	All
Oak*, cherrybark	<i>Quercus pagodafolia</i>		M	H	75	III
Oak*, overcup	<i>Quercus lyrata</i>		VH	H	70	II, III
Oak*, pin	<i>Quercus palustris</i>	5.5–6.5	M–L	H	75	All
Oak*, shumard	<i>Quercus shumardi</i>		M–L	H	80	II, III
Oak*, swamp chestnut	<i>Quercus michauxii</i>		M–H	H	75	III
Oak*, swamp white	<i>Quercus bicolor</i>	6.6–7.5	M–H	H	70	All
Oak*, willow	<i>Quercus phellos</i>		M	H	70	II
Pawpaw*	<i>Asimina triloba</i>		M	H	25	All
Pecan*	<i>Carya illinoensis</i>	6.6–7.5	M	H	80	All
Persimmon*	<i>Diospyros virginiana</i>	6.1–6.5	M	H	50	II, III
Sugarberry	<i>Celtis laevigata</i>		M–L	H	80	II, III
Sweetgum	<i>Liquidambar styraciflua</i>		M	H	90	III
Sycamore	<i>Platanus occidentalis</i>	6.6–8.5	H	H	90	All
Walnut*, black	<i>Juglans nigra</i> 6.6–8.5		M–L	H	80	All
Water tupelo	<i>Nyssa aquatica</i>		VH	H	90	III
Willow, black	<i>Salix nigra</i>	6.6–7.5	H	M	60	All
Winterberry, common	<i>Ilex verticillata</i>	4.5–8.0	VH	M	20	II, III

*Heavy-seeded species preferred for seeding and planting to increase species diversity.

¹ pH Range: from Hightshoe, G. L., 1988, *Native Trees, Shrubs and Vines for Urban and Rural America*.

² Flooding Tolerance (or general capacity of the plant to withstand standing water): VH = able to survive deep, prolonged flooding for more than one year; H = able to survive deep flooding for one growing season, with mortality occurring if flooding is repeated the following year; M = able to survive flooding or saturated soils for 30 consecutive days during the growing season; L = unable to survive more than a few days of flooding during the growing season without mortality.

³ Wildlife Merit: The potential for the plant to provide useful cavity sites and/or quality fruit production for wildlife. H = excellent large cavity potential and/or high quality fleshy fruit or nut production; M = moderate cavity potential or fruit production; L = low cavity potential and dry, non-nut fruit production.

⁴ Height: Potential height at physical maturity.

⁵ Illinois Plant Suitability Zones. See Illinois NRCS Field Office Technical Guide, Section II - Climatic Data.

Part III. Specifications Sheet

Use Specification Sheet provided with general Riparian Forest Buffer Job Sheet. Include fish and wildlife species expected to use area and maintenance specifications relevant to this species or assemblage. Consider instream habitat component needs (water temperature, minimum flows, wood and organic debris, sediment-free substrates) when designing maintenance or other riparian uses such as timber harvest, grazing, water withdrawal for irrigation, or recreation.

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